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Image AF/1764 \$  
Case No. 5019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: DIRK L. VAN HYNING  
Serial Number: 09/585,762  
Filed: 10-Mar-2003  
For: **YARNS AND FABRICS HAVING A WASH-DURABLE ANTIMICROBIAL  
SILVER PARTICULATE FINISH**  
Group Art Unit: 1764  
Examiner: ALEXIS A. WACHTEL

Mail Stop Appeal Brief  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

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Signature: Alissa D. Kohlman

Name: Alissa D. Kohlman

**TRANSMITTAL OF APPEAL BRIEF AND AUTHORIZATION TO CHARGE  
DEPOSIT ACCOUNT**

Sir:

Applicant hereby transmits its Appeal Brief, in triplicate. Please charge the fee pursuant to 37 C.F.R. 1.17(c) of \$330.00 to Deposit Account No. 04-0500 as well as any additional fee required. A duplicate copy of this Authorization is provided.

Respectfully requested,

April 6, 2004

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Application of: Dirk Van Hying  
Serial Number: 09/585,762  
Filed: June 2, 2000  
For: Yarns and Fabrics Having A Wash-Durable Antimicrobial Silver  
Particulate Finish  
Group Art Unit: 1764  
Examiner: Alexis A. Wachtel

**BRIEF ON APPEAL UNDER 37 CFR 1.192**

Commissioner for Patents  
PO Box 1450  
Alexandria, Virginia 22313-1450

Sir:

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Signature:

Name: Alissa D. Kohlman

The following Appeal Brief is submitted pursuant to the Notice of Appeal filed on or about February 6, 2004 from the Final Office Action dated November 6, 2003.

**I. REAL PARTY IN INTEREST**

The above-referenced application is the subject of an assignment to Milliken & Company, located at 920 Milliken Road, Spartanburg, South Carolina, which is the real party in interest.

**II. RELATED APPEALS & INTERFERENCES**

Patent Application Serial No. 09/586,381 (also assigned to Milliken & Company) filed on June 2, 2000 is also under appeal.

**III. STATUS OF CLAIMS**

Claims 17-32 have been rejected and are the subject of this Appeal.

**IV. STATUS OF AMENDMENTS**

No Amendments were filed after the Final Office Action.

## **V. SUMMARY OF THE INVENTION**

The subject application is related to improvements in durable silver particulate treatments for yarns and textile fabrics.

Claim 17 is directed to a substrate treated with a finish comprised of (1) solid compounds selected from the group consisting of metal particles, metal salts, metal oxides, and any combinations thereof and (2) at least one binder material. The binder material is not readily water soluble after application to the substrate and can withstand attack by standard laundering additives (such as detergents, solvents, bleaches, or mixtures thereof) and can withstand exposure to high temperatures associated with standard drying temperatures. The substrate may be a yarn, a fabric comprised of individual fibers, or a film. The finish is integrally retained on at least one portion of the surface of the substrate after 10 washes (as tested according to AATCC Test Method 130-1981). The amount of finish retained is at least 30% of the amount of the finish present on the substrate prior to any wash procedure.

The features of Claim 17 are described, for example, in the specification on page 4 (lines 17-21) to page 5 (lines 1-8), page 6 (lines 3-11), and page 13 (lines 6-8). See also the test results presented in Tables 1-3.

Claim 18 depends from Claim 17 and is directed to a treated substrate wherein the substrate is an individual yarn. The features of Claim 18 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 19 depends from Claim 17 and is directed to a treated substrate wherein the substrate is a textile fabric. The features of Claim 19 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 20 depends from Claim 17 and is directed to a treated substrate wherein the finish is comprised of silver particles. The features of Claim 20 are described, for example, in the specification on page 8 (lines 17-21) to page 9 (lines 1-4). See also the test results presented in Tables 1-3.

Claim 21 depends from Claim 17 and is directed to a treated substrate wherein the treatment is integrally retained in an amount of at least 30% after 20 washes. The features of Claim 21 are described, for example, in the specification on page 5 (lines 19-21) to page 6 (lines 1-2). See also the test results presented in Tables 1-3.

Claim 22 depends from Claim 21 and is directed to a treated substrate wherein the treatment is integrally retained in an amount of at least 30% after 30 washes. The features of Claim 22 are described, for example, in the specification on page 5 (lines 19-21) to page 6 (lines 1-2). See also the test results presented in Tables 1-3.

**\*\*There is no Claim 23.\*\***

Claim 24 depends from Claim 21 and is directed to a treated substrate wherein the substrate is an individual yarn. The features of Claim 24 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 25 depends from Claim 21 and is directed to a treated substrate wherein the substrate is a textile fabric. The features of Claim 25 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 26 depends from Claim 21 and is directed to a treated substrate wherein the finish comprises silver particles. The features of Claim 26 are described, for example, in the specification on page 8 (lines 17-21) to page 9 (lines 1-4). See also the test results presented in Tables 1-3.

Claim 27 depends from Claim 22 and is directed to a treated substrate wherein the substrate is an individual yarn. The features of Claim 27 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 28 depends from Claim 22 and is directed to a treated substrate wherein the substrate is a textile fabric. The features of Claim 28 are described, for example, in the specification on page 4 (lines 17-21) and page 10 (lines 13-21) to page 11 (lines 1-19).

Claim 29 depends from Claim 22 and is directed to a treated substrate wherein the finish is comprised of silver particles. The features of Claim 29 are described, for example, in the specification on page 8 (lines 17-21) to page 9 (lines 1-4). See also the test results presented in Tables 1-3.

Claim 30 depends from Claim 17 and is directed to a treated substrate wherein the at least one portion of the treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981. The features of Claim 30 are described, for example, in the specification on page 5 (lines 5-8) and on page 8 (lines 16-21) through page 9.

Claim 31 depends from Claim 21 and is directed to a treated substrate wherein the at least one portion of the treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981. The features of Claim 31 are described, for example, in the specification on page 5 (lines 4-14). See also the test results presented in Tables 4 and 5.

Claim 32 depends from Claim 22 and is directed to a treated substrate wherein the at least one portion of the treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981. The features of Claim 32 are described, for example, in the specification on page 5 (lines 4-14). See also the test results presented in Tables 4 and 5.

**VI. ISSUES**

At issue in the present Appeal is:

Whether Claims 17-32 are properly rejected under 35 USC 103(a) as being unpatentable over Sawan et al. (US Patent No. 5,849,311) in view of Young, Sr. et al. (US Patent No. 5,432,000).

**VII. GROUPING OF CLAIMS**

Appellants respectfully submit that all of the claims stand together.

**VIII. ARGUMENT**

The Office has rejected Claims 17-32 as being unpatentable under 35 USC 103(a) over Sawan et al. (US Patent No. 5,849,311) in view of Young, Sr. et al. (US Patent No. 5,432,000).

Sawan et al. is directed to contact-killing non-leaching antimicrobial materials (Abstract), while Young, Sr. et al. is directed to fiber products comprised of dry discontinuous fibers having starch binder on at least a portion of the fiber surfaces (Abstract).

More specifically, Sawan et al. disclose an antimicrobial material comprised of a combination of an organic material which forms a matrix and a biocide which interacts strongly enough with the matrix that it does not leach from the matrix. The organic material must be capable of reversibly binding or complexing with the biocide and must further be capable of insinuating the biocide into the cell membrane of the microorganism. (Col. 2, lines 43-51). The preferred organic material is crosslinked to form the matrix. One preferred organic material is polyhexamethylene biguanide polymer crosslinked with an epoxide to form a crosslinked matrix (col. 3, lines 27-41). Metallic materials which are bactericidal or bacteriostatic are preferred, such as silver compounds like silver halide or silver iodide (col. 3, lines 42-65).

Young, Sr. et al. teach binder materials for treating discontinuous fibers. The binder materials are preferably of the type that are capable of subsequently binding the fibers to one another or to other fibers during the manufacture of webs (col. 9, lines 6-12). Suitable binders include

polymeric materials which are thermoplastic or thermosetting and may be provided in liquid form as latexes (col. 9, lines 36-45). In selecting a suitable binder, Young, Sr. et al. disclose that the proper functionality of the binder should be considered such that for particulate materials (like super absorbent polymers), the binder surface structure is capable of hydrogen bonding to like surface structures on the surface of the particulate. The binder should also have good intermolecular contact between the binder and particles, and it should be persistent. (Col. 11, lines 3-32).

It is specifically acknowledged by the Office that Sawan et al. fail to teach the use of a binder having the claimed properties (see Office Action dated August 14, 2003). Thus, the Office combines the teachings of Sawan et al. with Young, Sr. et al. to reject Claims 17-32.

The Office's argument with regard to Appellants' Claims 17-32 is as follows (see Office Action dated August 14, 2003):

Sawan et al. disclose a contact-killing coating on a substrate (Col 4, lines 21-26) wherein the biocidal material used is of a metallic material, wherein the metallic material can be a metal, metal oxide, metal salt, metal complex, metal alloy or mixture (Col 3, lines 47-52). Metals that can be used include silver, zinc, cadmium, lead, mercury, antimony, gold, aluminum, copper, platinum and palladium, their salts, oxides, complexes, and alloys. (Col 3, lines 47-60). Said metallic material is in particulate form that is dispersed in an emulsion (Col 4, lines 1-5). The emulsion or suspension includes a crosslinking agent (Col 4, lines 5-17) which together with the emulsion broadly constitutes a binder. Said contact-killing coating can be used on wound dressing, personal hygiene products, household products, food preparation surfaces and packaging, water storage, treatment and delivery systems, biosensitive systems, lab equipment (Col 12, lines 32-40) as well as surgical gloves (Col 1, line 67). Conventionally, wound dressings are woven or nonwoven, food packaging materials and surgical gloves are films and personal hygiene products such as diapers have nonwoven materials as well as film layers that could be coated with said contact-killing coating. Inherently, if contact-killing coating is applied to a woven or nonwoven, at least some yarns or fibers will be coated completely.

Young teaches that binders having good intermolecular contact between the binder and particles are especially desirable. (Col 11, lines 19-21). Young discloses that such desirable binders used in emulsion form include polyesters, polyimides, melamine/formaldehyde, epoxy and other binder materials (Col 9, lines 35-67, Col 10, lines 1-19).

In view of this teaching, it would have been obvious to one of ordinary skill to have used any of the binders disclosed by Young instead of the binder disclosed by Sawan et al. since the binders disclosed by Young are equivalently useful and are more available or cost effective.

Although Sawan et al. and Young fail to explicitly teach the claimed percentage of biocidal coating integrally retained on substrate after the claimed number of washes, claimed log kill rate, or that the binder material used is susceptible to attack by a standard laundering additive selected from the group constituting of detergents, solvents, bleaches or mixtures thereof and is not susceptible to degradation due to exposure to high temperatures associated with standard laundry drying temperatures, it is reasonable to presume that said limitations are inherent to the invention. Support for said presumption is found in the use of similar materials (i.e. metallic biocidal suspension or binder applied to a substrate) used to produce the biocidal coated substrate. The burden is upon the Applicant to prove otherwise.

Appellants respectfully believe that the rejection of Claims 17-32 under 35 § 103(a) as being unpatentable over Sawan et al. (US Patent No. 5,849,311) in view of Young, Sr. et al. (5,432,000) is in error and should be withdrawn on the grounds that the rejection is based on a primary reference which Appellants have overcome with the submission of a proper Rule 1.132 declaration.

Appellants supplied proper declaratory evidence (submitted May 30, 2002) to illustrate that the best overall embodiment taught by Sawan et al. (in terms of an organic matrix for the durable topical application of biocides to substrates) did not function to the same extent as required



within Appellants pending claims. As a result, the Office agreed by removing the Sawan et al. reference as prior art (see page 2 of Final Office Action dated November 6, 2003).

The Office further states (see Final Office Action dated November 6, 2003):

Applicant's declaratory evidence (Rule 132 Declaration of David Green) overcame the art rejections based solely on Sawan et al.'s disclosure. Examiner agrees that Applicant's declaration demonstrated that Applicant's claimed properties are not inherent to the article of Sawan et al.'s disclosure. Sawan et al. was rendered inapplicable as prior art on its own due to the previously provided declaration.

A secondary reference, i.e., Young, Sr. et al. was provided to remedy the deficiencies of Sawan et al.'s disclosure. The art combination of Sawan et al. and Young Sr. et al. clearly results with Applicant's claimed article since the binder disclosed by Young, Sr. is chemically identical to the binder discussed by the Applicant in the Specification and provides clear motivation for its use with Sawan et al.'s article. As a result, the Declaration filed by the Applicant fails to address the shortcomings of Young, Sr. et al.'s teachings by way of a showing of unexpected results.

Appellants properly supplied the aforementioned declaratory evidence (Rule 132 Declaration of David Green) analyzing the preferred embodiment (biguanide matrix) with unreasonably higher amounts of silver iodide than were exemplified by Sawan et al. for silver retention durability after laundering (as required by the pending claims). The results showed that silver retention on the surface could not meet the same required durability levels present within the claims of Appellants' application, no matter how much silver iodide was initially present. That was all Appellants were required to do in meeting their burden of showing the inapplicability of Sawan et al. over their claims. There is simply no basis for Appellants to now compare the resultant materials of the combined teachings of the cited primary and secondary references. It is evident that, particularly in view of the above-noted Green Declaration, Appellants discovered unexpectedly improved silver retention after repeated launderings as compared with Sawan et

al.'s materials. Thus, the only way it can now be found that replacing Sawan et al.'s preferred biguanide "binder" (which, again, could not perform at the same level as is required by the present claims) with any other type of binder is a clear exercise of hindsight reconstruction of Appellants' own teachings. Regardless of Young, Sr. et al.'s teachings, the fact that Sawan et al. specifically taught that their best results for non-leaching and loss of biocide (silver iodide, in this instance) were provided by the already-tested biguanide "binder", it is clear that Appellants have overcome any basis of rejection involving this primary reference.

## IX. CONCLUSION

For the reasons set forth above, Appellants respectfully urge that the obviousness rejection of Claims 17-32 is improper. Reversal of this obviousness rejection, as presented in this Appeal, is hereby requested.

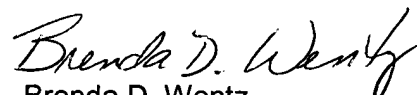
A copy of pending Claims 17-32 is attached as an Appendix hereto.

The Commissioner is hereby authorized to charge the Appeal Brief fee of \$330.00 to Deposit Account No. 04-0500. The Commissioner is also authorized to charge any additional fees that may be required, or credit any over-payment, to Deposit Account No. 04-0500. This Appeal Brief is being submitted in triplicate.

April 6, 2004

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**APPENDIX**

## 17. A treated substrate comprising

a finish comprising a) solid compounds selected from the group consisting of metal particles, metal salts, metal oxides, and any combinations thereof, and b) at least one binder material, wherein said binder material, after processing and application to said substrate, is not readily water soluble, is not susceptible to attack by a standard laundering additive selected from the group consisting of detergents, solvents, bleaches, or mixtures thereof, and is not susceptible to degradation due to exposure to high temperatures associated with standard laundry drying temperatures;

a substrate selected from the group consisting of a yarn, a fabric comprised of individual fibers, and a film, and having at least one surface thereof;

wherein said finish is adhered to at least one portion of said surface of said substrate;

wherein said finish is integrally retained on said at least one portion of said surface of said substrate, after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981, in an amount of at least 30% of the amount of said finish present on said at least one portion of the surface of said substrate prior to the performance of any wash procedure.

18. The substrate of Claim 17 wherein said substrate is an individual yarn.

19. The substrate of Claim 17 wherein said substrate is a textile fabric.

20. The substrate of Claim 17 wherein said finish comprises silver particles.

21. The substrate of Claim 17 wherein said treatment is integrally retained in an amount of at least 30% after 20 washes.

22. The substrate of Claim 21 wherein said treatment is integrally retained in an amount of at least 30% after 30 washes.

**\*\*There is no Claim 23.\*\***

24. The substrate of Claim 21 wherein said substrate is an individual yarn.

25. The substrate of Claim 21 wherein said substrate is a textile fabric.

26. The substrate of Claim 21 wherein said finish comprises silver particles.

27. The substrate of Claim 22 wherein said substrate is an individual yarn.

28. The substrate of Claim 22 wherein said substrate is a textile fabric.

29. The substrate of Claim 22 wherein said finish comprises silver particles.

30. The substrate of Claim 17 wherein said at least one portion of said treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981.

31. The substrate of Claim 21 wherein said at least one portion of said treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981.

32. The substrate of Claim 22 wherein said at least one portion of said treated substrate exhibits a log kill rate for *Staphylococcus aureus* of at least 1.5 and a log kill rate for *Klebsiella pneumoniae* of at least 1.5 after 10 washes as performed in accordance with the wash procedure of AATCC Test Method 130-1981.